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New Taxa and Combinations of Venezuelan Lycopodiaceae

BENJAMIN ØLLGAARD
Botanical Institute, University of Aarhus, 68 Nordlandsvej, DK-8240 Risskov, Denmark

Examination of ample material of the *Lycopodiaceae* for a treatment for the forthcoming Flora of the Venezuelan Guayana, by Julian A. Steyermark and collaborators, turned up two undescribed species of *Huperzia*, both of them endemic for the Roraima Formation of Venezuela. They are described below. In addition a new combination is made in *Lycopodiella*.

Huperzia beitelii B. Øllg., sp. nov. (Fig. 1 A–D).—TYPE: Venezuela, T. F. Amazonas, Dpto. Río Negro, Cerro de la Neblina, Camp VII, 5.1 km NE of Pico Phelps, stream banks of Caño Gardner, 0°50′40″N, 65°58′10″W, 1690 m, 12 Feb 1985, *Beitel 85191* (holotype AAU; isotype UC).

Species *Huperziae reflexae* aliquot affinis, a qua imprimis differt statura multo majore robustiore, foliis divisionum ut minimum basalium 7–16 mm longis, 1.5–2 mm latis, coriaceis, sparsim infirme denticulatis; surculi interdum sursum constricti, foliis multo brevioribus, adpressis, aliquot amplectentibus.

Plants terrestrial, ascending to erect from a decumbent base, up to ca. 100 cm tall or long, sparsely branched, up to 3 times dichotomous. Shoots homophyllous and almost equally thick throughout, ca. (15–) 18–30 mm in diam. incl. leaves, or sometimes gradually heterophyllous and greatly reduced and constricted upward, to 7–10 mm in diam. incl leaves. Stems excl. leaves 2–4 mm thick at the base, sometimes tapering to ca. 1.5 mm upward (dried), usually dark greyish brown (dried). Leaves all, or those of basal divisions, borne in more or less regular, often oblique, alternating whorls of 5 or 6, these (1.5–) 2–4 (–5) mm apart, forming 10–12 indistinct longitudinal ranks, spreading to recurved or reflexed, linear-lanceolate to lanceolate, broadest just above the base to below the middle, (7–) 10–15 mm long, 1.2–2 mm wide, not twisted at base, somewhat decurrent, adaxially flat to convex (dried), or with prominent vein ridge, usually shining, abaxially with slightly or not prominent vein, with flat to revolute, often irregularly and sparsely, sometimes inconspicuously, denticulate margins, soft-herbaceous to coriaceous, hypostomatic. Terminal divisions sometimes strongly constricted, up to 60 cm long, 5–8 mm in diam. incl. leaves, with leaves ascending to imbricate, lanceolate, broadest just above the base, 4–6 mm long, ca. 1.5 mm wide, abaxially convex, with leaf base usually clasping the sporagium. Sporangia 1.5–2 mm wide.

This species occurs in low scrub, low open forest, bogs with bromeliads, and in mixed *Bonnetia* forest, from 1690 to 2500 m. The type was found with dense growths of the 1.5 m tall terrestrial bromeliad *Brocchinia tatei* with scattered trees and shrubs and acidic sandstone outcrops; several other terrestrial lycopods grew in the area (*Lycopodium clavatum*, *Huperzia reflexa*, *Lycopodiella cernua*, and *L. riofrioi*). Endemic for the Venezuelan Guayana.

Paratypes: **VENEZUELA. T. F. Amazonas**. Cerro de la Neblina (*Beitel 85176* (AAU, UC), *Funk 6702* (AAU), *Nee 30608, 30789* (AAU). **Edo. Bolívar**. Chimantá Massif, *Steyermark 75832* (VEN), *Steyermark & Wurdack 882* (AAU, F, VEN), *1139* (AAU, F, GH, VEN); Cerro Roraima, *Delascio & Brewer 4798* (GH); Kamarkaibaray-tepuí, E of Auyán-tepuí, *Delascio 13173* (MO); Cerro Marahuaca, *Steyermark et al. 124461* (MO), *125999* (AAU).

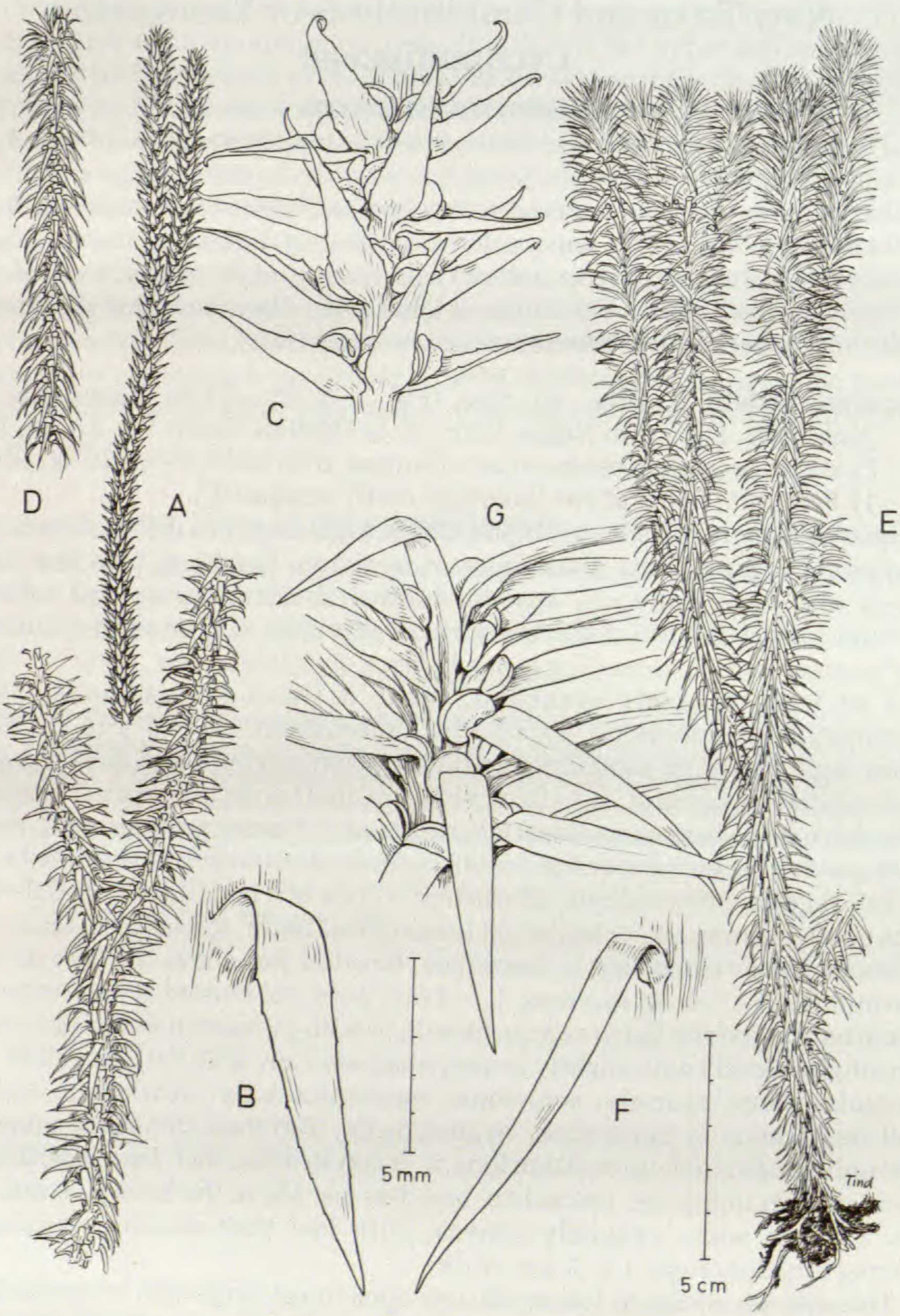

FIG. 1. New species of *Huperzia*. A–C, *Huperzia beitelii* (holotype). A, Basal division (below) and apical constricted division (above). B, Leaf from basal division. C, Portion of apical division. D, *Huperzia beitelii*, apical division (*Steyermark & Wurdack 1139*, AAU). E–G, *Huperzia huberi* (holotype). E, Habit. F, Leaf from basal division. G, Portion of apical division.

This species seems related to *Huperzia reflexa* but differs from this in its much larger proportions and coarser texture. Some collections of *H. beitelii* from Cerro de la Neblina (including the holotype) are unusual among the erect terrestrial species in exhibiting marked heterophylly. The only other species that does the same is *H. robusta* (Klotzsch) Holub, which has not been recorded from Cerro de la Neblina. Most collections, e.g., the one shown in Fig. 1 D, are not constricted in apical divisions. The occurrence of constricted apical divisions may be correlated with size and age of the individual.

Huperzia huberi B. Øllg., sp. nov. (Fig. 1 E–G).—TYPE: Venezuela, Edo. Bolívar, Distr. Piar, Macizo de Chimantá, altiplanicie en la base meridional de los farallones superiores del Apacará-tepui, sector Norte del Macizo, 5°20′N, 62°12′W, ±2200 m, 30 Jan–1 Feb 1983, *Steyermark, Huber & Carreño 128412* (holotype AAU).

Species *Huperziae recurvifoliae* Rolleri affinis, a qua differt imprimis foliis latioribus, apicibus foliorum acutis rectis vel curvatis gradatim angustatis, non in acumine tortuosa protractis.

Plants terrestrial, erect or ascending to erect from a decumbent base, up to ca. 40 cm tall, sparsely branched, up to 4 times dichotomous. Shoots homophyllous, almost equally thick throughout, ca. 15–28 mm in diam. incl. leaves (depending on leaf direction), sporangiate from approx. 15–30 cm above the stem base and upward, often in separate, seasonally produced zones. Stems excl. leaves 3–5 mm thick (dried) at the base, sometimes tapering to ca. 1.5 mm upward. Leaves borne in more or less regular, often oblique, alternating whorls of 6–8, these 1–2 mm apart, forming 12–16 indistinct longitudinal ranks, spreading to ascending, slightly to strongly recurved from an ascending leaf base, linear to linear-lanceolate, broadest near the base, 8–14 mm long, (1–) 1.2–1.6 (–2) mm wide, adaxially flat to somewhat concave (dried), abaxially with slightly tumid vein, usually somewhat shining, hypostomatic, with entirely smooth margins. Sporangia 1.5–2 mm wide.

This species occurs in open situations on sandstone mesetas, and in swampy savannas, from 2000 to 2300 m. Endemic for the Venezuelan Guayana.

Paratypes: **VENEZUELA. T. F. Amazonas**. Cerro Yaví, *Huber 11909* (AAU); Cerro Paraque, *Phelps 140* (VEN). **Edo. Bolívar**. Apacará-tepui, *Steyermark et al. 128412* (AAU); Auyán-tepuí, *Steyermark 93912* (GH, NY, VEN); Chimantá Massif, *Huber 7041* (AAU), 11473 (AAU).

Common name: "Itu-yek" (arekuna).

This is closely related to *Huperzia recurvifolia* Rolleri and *H. hippuridea* (Christ) Holub. From the former it is recognized by its broader leaves, which taper gradually into an acute apex. In *H. recurvifolia* the apex is protracted into a narrow, twisted, often yellowish or transparent, whip-like tip. From *H. hippuridea* it is distinguished by the broader, more densely crowded leaves, which are recurved from an ascending leaf base, and not reflexed from the very base.

Lycopodiella iuliformis (L. Underw. & F. Lloyd) B. Øllg. var. **tatei** (A. C. Smith) B. Øllg., comb. et stat. nov.—*Lycopodium tatei* A. C. Smith, Bull. Torrey Bot. Club 57:180. 1930.

Lycopodium duidae A. C. Smith in Gleason, Bull. Torrey Bot. Club 58:311, 1931, with type from Cerro Duida, appears synonymous.

This is distinguishable from the type variety by its swollen and spongy horizontal stems. It occurs at lower elevations than the type variety. The spongy character of rhizome may represent an adaptation to growth in very shallow water.

Specimens studied: **VENEZUELA. T. F. Amazonas**. Cerro Autana, *Steyermark 105154* (VEN); Depto. Atures: Valley of Río Coro-Coro, W of Serrania de Yutaje, *Holst & Liesner 3221* p. p. (AAU). **Edo. Bolívar**. Mount Roraima, Emerald Swamp, *Steyermark 58610* (F); Río Uarama, below Uarama-tepuí, NE of Luepa, *Steyermark & Nilsson 635-A* (VEN); Camp Ucaima, at Canaima, *Oberwinkler 15466* (M); Auyán-tepuí, Guayaraca, *Schnee 1449* p. p. (VEN), *Vareschi & Foldats 4622* (VEN); Kanavayén, trail Misión Sta. Teresita—Río Pakairau, *Moore et al. 9605* (GH, VEN). **BRAZIL. Terr. Roraima**. Upper slopes of Serra Parima, S of Auaris, *Prance et al. 9791* (M, S, US). ?**Piauí**: "Piauhy: Brejo do Correio", *Luetzelburg 18872* p. p. (M).